

Applicant: Teppo Kojo
Application No.: 10/554,009
Response to Office action mailed Jun. 5, 2008
Response filed Oct. 6, 2008

Claim Listing

1-9. (cancelled)

10. (currently amended) A method for calculating[[/]] and optimizing the diameter of a paper or board web machine reel, in which a web is wound in a paper or board machine into machine reels on a reel-up, which are run on a slitter-winder to form customer rolls, whose desired diameter and width are determined according to customer need, and in which a continuous-trimming running mode is used in which a desired amount of web is run into a machine reel and, when needed, splicing is performed on the slitter-winder to produce customer rolls with a desired diameter size, the method comprising the steps of:

determining the diameter of the machine reel to be wound on the paper or board machine on the basis of restrictions set by the customer on the location of a splice in the customer roll [[and]] such that the amount of broke being produced from the machine reel is optimized, ~~that, in the method, wherein~~ information about the customer rolls to be slit is obtained from a production control system for calculating[[/]] and optimizing a machine reel diameter instruction for the purpose of optimizing the diameter of the next machine reel, and [[that]] the calculated/optimized machine reel diameter instruction is set in a control system of the reel-up; and

forming a machine reel on the paper or board machine according to the machine reel diameter instruction.

11. (previously presented) The method of claim 10 wherein the calculated/optimized machine reel diameter instruction is fed manually to the control system of the reel-up.

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12. (previously presented) The method of claim 10 wherein the calculated/optimized machine reel diameter instruction is transmitted automatically to the control system of the reel-up.

13. (currently amended) The method of claim 10 wherein ~~[[the]]~~ restrictions on the splice location are set according to each individual paper grade, printing house and/or order.

14. (currently amended) The method of claim 10 wherein ~~[[the]]~~ number and ~~[[the]]~~ location of the splices to be placed in customer rolls and the resultant machine reel broke, caused because of the joining of machine reels to one another, are optimized.

15. (currently amended) The method of claim 10, wherein the step of determining the diameter of the machine reel to be wound further comprises accounting for undersize machine reels produced as a result of web breaks on the paper or board machine by calculating the diameter of the undersize surface set of said undersize machine reel, and checking the splice location restrictions, and if the restriction is not violated, proceeding with the calculation of the next machine reel, if the restrictions are violated, proposing a change in the running order of machine reels and the optimization of the location of the splice used for joining them are taken into account in the method.

16. (currently amended) The method of claim 10 further comprising the step of changing ~~wherein the~~ slitting order of machine reels ~~is changed by means of the method.~~

17. (currently amended) The method of claim 10, ~~wherein the method is applied as~~ a further comprising performing the steps within a stand-alone system in connection with a slitter-winder and a machine reel-up.

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18. (previously presented) The method of claim 10, ~~wherein the method is applied as a part of~~ wherein the steps are performed within a production control system of the paper or board machine.

19. (previously presented) A method of forming customer rolls on a slitter-winder from machine reels formed on a paper or board machine having a reel-up, the method comprising the steps of:

winding a first machine reel of a paper or board web on the paper or board machine reel-up, the first machine reel being formed to have a first diameter;
winding a second machine reel of a paper or board web on the paper or board machine reel-up, the second machine reel being formed to have a second diameter; and
running the first machine reel and the second machine reel on the slitter winder, and splicing the webs of the two machine reels together on the slitter winder, the spliced-together webs being run into a plurality of customer rolls, wherein the customer rolls are formed to have a desired diameter and width which are determined according to a customer's need, and wherein one of the first and second reel is wound to a machine reel diameter instruction, said machine reel diameter instruction being determined on the basis of restrictions set on the location of a splice in the customer roll, wherein information about the customer rolls to be slit is obtained from a production control system for determining the machine reel diameter instruction, and the machine reel diameter instruction is set in a control system of the reel-up.

20. (currently amended) The method of claim 19 further comprising the step of manually feeding the determined machine reel diameter instruction to the control system of the reel-up.

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21. (previously presented) The method of claim 19 wherein the determined machine reel diameter instruction is transmitted automatically to the control system of the reel-up.

22. (previously presented) The method of claim 19 wherein the restrictions on the splice location are set according to each individual paper grade, printing house and/or order.

23. (previously presented) The method of claim 19, wherein one of the first machine reel and the second machine reel is an undersize machine reel produced as a result of a web break on the paper or board machine.

24. (previously presented) The method of claim 19 further comprising the step of changing the order of the first and second machine reels being run on the slitter winder.

25. (previously presented) The method of claim 19, wherein the method is applied as a stand-alone system in connection with a slitter-winder and a machine reel-up.

26. (previously presented) The method of claim 19, wherein the method is applied as a part of a production control system of the paper or board machine.

27. (cancelled)

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28. (currently amended) ~~The method of claim 19~~ A method of forming customer rolls on a slitter-winder from machine reels formed on a paper or board machine having a reel-up, the method comprising the steps of:

winding a first machine reel of a paper or board web on the paper or board machine reel-up, the first machine reel being formed to have a first diameter;

winding a second machine reel of a paper or board web on the paper or board machine reel-up, the second machine reel being formed to have a second diameter; and

running the first machine reel and the second machine reel on the slitter winder, and splicing the webs of the two machine reels together on the slitter winder, the spliced-together webs being run into a plurality of customer rolls, wherein the customer rolls are formed to have a desired diameter and width which are determined according to a customer's need, and wherein one of the first and second reel is wound to a machine reel diameter instruction, said machine reel diameter instruction being determined on the basis of restrictions set on the location of a splice in the customer roll, wherein information about the customer rolls to be slit is obtained from a production control system for determining the machine reel diameter instruction, and the machine reel diameter instruction is set in a control system of the reel-up;

wherein the step of determining a machine reel diameter instruction takes into account an order list including desired customer roll diameter, core diameter, number of sets to be run, restrictions on machine reel dimensions, and further comprises:

calculating the surface area and diameter of a bottom set; and

checking that the splice formed by joining a machine reel of a diameter determined by the machine reel diameter instruction and another machine reel, based upon set splice location restrictions, will not be too close to the bottom or the surface of the customer roll; and wherein if the splice location is acceptable the machine reel diameter instruction does not change; and wherein if the splice location is

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too close to the bottom the machine reel diameter instruction is reduced such that the splice location is acceptable; and wherein if the splice location is too close to the surface the machine reel diameter instruction is reduced ~~increased~~ such that the splice location is acceptable.

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29. A process for forming machine reels and converting them to smaller diameter customer rolls comprising the steps of:

forming a plurality of machine reels, each machine reel having an area less than or equal to a selected maximum machine reel area;

wherein an acceptable roll area range is range of roll areas such that a splice between the customer roll of the acceptable roll area and subsequent paper to bring said customer roll to said smaller diameter will not be located too close according to customer criteria to a bottom or a surface of the formed customer roll;

determining the desired final area of a presently being formed machine reel by determining how much of the presently being formed reel will be partially wound into a customer roll which is formed, in part, of a previously formed machine reel;

determining a remainder reel area which is the selected maximum machine reel area, less the area of as many complete customer rolls as possible to be formed, and if the remainder reel area will form a customer roll within the acceptable roll area range, then continuing to wind the presently being formed machine reel to the maximum machine reel area;

if the remainder reel area is below the acceptable roll area range, then decreasing the area of the presently being formed machine reel so that the remainder reel area is zero; and

if the remainder reel area is above the acceptable roll area range, then decreasing the presently being formed machine reel area so that the remainder reel area falls within the acceptable roll area range.

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30. A process for forming machine reels and converting them to smaller diameter customer rolls comprising the steps of:

forming a plurality of machine reels, each machine reel having an area which is less than or equal to a selected maximum machine reel area;
forming a machine reel as a result of a paper break of a selected area less than the selected maximum machine reel area;
determining the desired final area of a presently being formed machine reel by
determining how much of the present reel will be wound into a customer roll which is formed in part of a previously formed machine reel formed before the machine reel as a result of a paper break,
determining a remainder reel area as the selected maximum machine reel area less the area of as many complete customer rolls as possible, and
determining if the remainder reel area will form a customer roll of an area within a selected range based on splice location restrictions set by the customer, and
if the remainder reel area is below the selected range, decreasing the diameter of the present machine reel so that the remainder reel area is zero, and
if the remainder reel area is above the selected range, decreasing the present machine reel area so that the remainder reel area falls within the selected range, and
further selecting the area of the presently being formed machine reel so that the machine reel formed as a result of a paper break when formed into customer rolls after the presently being formed machine reel, will also form a last customer roll of an area within the selected range.